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Diving injuries of the spinal cord

Diving injuries to the cervical spine and spinal cord are a serious medical problem with long-term social and economic consequences. The exact incidence of these injuries in South Africa is unknown. In the USA, it is estimated that 1 800 serious diving injuries to the spine occur annually; diving accidents are therefore a major cause of spinal cord injury. It is probable that the actual incidence of diving injury is much higher, since many cases of death by 'accidental drowning' result from paralysis or unconsciousness. In addition to the incalculable human suffering, the economic consequences of these injuries are immense.

In 1981, the circumstances of injury in patients admitted to the Conradie Hospital Spinal Cord Injuries Centre in Cape Town between 1965 and 1979 were reviewed. This centre admits all cases of spinal cord injury in the Cape Province and therefore reflects the incidence of injury in that province. An incidence of approximately 3 patients per annum was noted and it was commented that there was in South Africa a general lack of awareness and interest in the prevention of these injuries. Anecdotal evidence suggests that the situation has improved little over the years. A repeat study of all patients paralysed as a result of diving injuries and admitted to the Conradie Hospital Spinal Cord Injury Centre during the period 1980 - 1990 was made to assess the present situation accurately. The results of this analysis showed that the incidence of spinal cord injuries due to diving accidents in the Cape Province doubled during the period under review. Fifty-eight patients with paralysis were admitted during this period. There was no change in the spectrum of orthopaedic injuries, the commonest being 'tear-drop' fracture of the vertebral body, usually at the C5 level. The neurological deficit associated with orthopaedic injuries was unfortunately severe, with 65% of patients sustaining complete, permanent quadriplegia. The number of patients who had consumed alcohol prior to injury could not be assessed with accuracy, but a significant number of patients admitted to having consumed large quantities of alcohol before the accident. In 2 patients, no paralysis was present after the diving injury, but paralysis ensued while the patient was being extricated from the water or transported to hospital.

This analysis shows that the incidence of diving injuries in the Cape Province has increased significantly over the past 10 years and, by extrapolation, probably throughout South Africa. This is not surprising. It reflects a general lack of interest in the prevention of these injuries. Alcohol as a precipitating factor in diving injuries has been reported world-wide and South Africa is no exception. An analysis of the role of alcohol in drowning in greater Cape Town showed that 64% of adult victims were under the influence of alcohol at the time of death. That 2 patients were paralysed during extrication from the water is also not surprising. It is well documented that many patients with a diving-related cervical spinal injury sustain a secondary injury to the spinal cord during rescue and transport. First aid personnel adequately trained in the management of diving injuries are rarely available at the pool-side or at beaches unless trained lifesavers are in the vicinity. Recently, concern has been expressed because, unlike other countries in the Western world, the incidence of rugby spinal injuries in South Africa has increased. A similar pattern is evident as regards paralysis due to diving injuries. After much controversy and publicity, far-reaching measures have been instituted to decrease the incidence of rugby spinal cord injuries, but no similar measures have been adopted to decrease the incidence of diving injuries. Active preventive campaigns are carried out in countries like New Zealand and Australia. Simple and inexpensive measures such as adequate and conspicuous sign-posting of the deep and shallow ends of municipal pools should immediately be instituted. The same pool should not be used for both diving and swimming. The larger problem of alcohol abuse in relation to not only motor vehicle accidents, but swimming and diving injuries, should also receive more attention and publicity. Special training of swimming pool attendants and first aid personnel in correct rescue techniques and initial management of patients with diving spinal injuries is essential. Probably, the most important

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preventive measure is education to instil an awareness of the danger of diving into shallow water. This must be instituted at school level, where the dangers can be clearly and simply explained utilising a 'look before you leap' format. South Africa has lagged behind the rest of the world in the prevention of paralysis due to rugby and diving spinal cord injuries. With regard to rugby, this omission has finally been addressed. It is high time that diving injuries attracted the same interest and effort in order to decrease the incidence of these serious injuries.

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Prevention of hearing impairment

Hearing impairment among all population groups in South Africa is as big a problem here as anywhere else in the world. In fact, of all disabilities, impaired hearing is the commonest and affects some 2 million individuals in South Africa.

For many years the major concern of health and welfare services was the treatment, education and habilitation or rehabilitation of hearing-impaired individuals. More recently, the issue of prevention was addressed anew by the South African National Council for the Deaf (SANCD) and prevention has since been incorporated into the overall mission of the Council.

Informal observations by the SANCD, especially among black children, indicate that many individuals suffer from some form of hearing impairment which could in many instances have been prevented. The implications of impaired hearing are far-reaching, the central problem being that of limited ability to communicate. Prevention programmes in developing countries, recently initiated by the United Nations in co-operation with the International Agency for the Prevention of Deafness, are seen as an endorsement of the Council's endeavour to develop a prevention progamme closer to home.

In a study on prevention strategies commissioned by the SANCD, it was shown that there is a lack of essential data on the aetiology and general epidemiology of hearing impairment, e.g. data on types of deafness, causes, incidences or prevalences stratified by age, sex, population group and area. Despite the absence of essential data, there is sufficient evidence to identify the major avenues for addressing the concerns underlying impaired hearing in South Africa.

Ingorance and/or neglect of elementary do's and don'ts by the public, parents, the health fraternity and industry contribute significantly to the prevalence of impaired hearing. An appropriate awareness programme is thus considered one of the most cost-effective strategies of prevention.

Some 80% of persons under the age of 20 years with seriously impaired hearing acquire the problem before the age of 3 years. Maximum use of available hearing for language development can only be effected if the problem is detected early. The majority of hearing-impaired children are detected too late to benefit adequately from early intervention. A nation-wide application of the early detection programme used in the Cape is advocated. Evaluation centres at grassroots level are seen as an essential component of an early detection programme.

Despite the existence of various acts and regulations to control the exposure of employees to noise, compliance with protection regulations is still a major concern in industry. Consequently, a comprehensive hearing conservation programme has been designed for industry. The SANCD advocates and is distributing this. Public awareness of certain recreational risks for noise-induced hearing impairment would also assist hearing protection.

Infections associated with prenatal disease and care are still a major cause of hearing impairment. Many of these can be prevented by primary health care programmes. In some areas nearly 50% of white schoolgirls are still susceptible to rubella, which is a major cause of deafness in whites. The SANCD has made an urgent appeal to the Department of National Health and Population Development (DNHPD) to introduce the internationally tried and tested mumps, measles and rubella vaccine for children for both sexes between the ages of 12 and 15 months. Impaired hearing is closely related to certain sexually transmitted diseases, e.g. syphilis, which is still common in certain sectors of the population. It can be successfully contained by early detection and treatment. General good prenatal and perinatal care would also contribute significantly to the prevention of mortality and morbidity, including impaired hearing.

Impaired hearing is often the consequence of childhood diseases such as measles, tuberculosis and meningitis. In many areas, measles immunisation is still not adequate. Tuberculosis is common in developing communities and is related to poor socio-economic conditions. Although immunisation against most diseases is provided free of charge, logistical problems and compliance with complete schedules are the main limiting factors. In the case of TB, some 20% of patients do not complete their schedules.

Awareness, education and training, supported by the logistical back-up and infrastructure, are areas to be addressed. The SANCD is urging the DNHPD to consider the more effective Edmonston-Zagreb measles vaccine for children aged 6 months rather than continue using the traditional Schwarz strain.

Hearing impairment is often associated with congenital hypothyroidism. Treatment is very economical and effective provided it is started soon. Screening of newborns in South Africa is still uncommon (for cost reasons). Screening began in Pretoria on a pilot basis in 1981, and 77 000 babies had been tested by 1990. Twenty-one confirmed cases of hypothyroidism have been detected and treated. At this stage the SANCD endorses a much larger screening programme, irrespective of who assumes financial responsibility.

Genetic factors contribute to impaired hearing in varying degrees in the different population groups. In whites and Asians, for example, approximately 35% of impaired hearing in children can be attributed to genetic factors. In blacks, genetic factors play a much smaller role and are responsible for approximately 10% of cases.